

California Environmental Protection Agency
AIR RESOURCES BOARD

PROPOSED

**CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES
FOR 2001 AND SUBSEQUENT MODEL
PASSENGER CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES**

Adopted: _____

NOTE: This document contains the majority of the requirements necessary for certification of a vehicle for sale in California in addition to containing the exhaust emission standards and test procedures for motor vehicles. However, reference is made in these test procedures to other documents that contain additional requirements necessary to complete an application for certification. These documents are designed to be used in conjunction with this document. These documents include (but are not limited to):

1. “California Zero-Emission and Hybrid Electric Vehicle Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles;”
2. “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles;”
3. “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles;”
4. OBD II;
5. HEV TPs; and
6. Labeling Specifications.
7. Warranty
8. Fill Pipe Specs

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**CALIFORNIA EXHAUST EMISSION STANDARDS AND TEST PROCEDURES
FOR 2001 AND SUBSEQUENT MODEL
PASSENGER CARS, LIGHT-DUTY TRUCKS AND MEDIUM-DUTY VEHICLES**

The provisions of Subparts B, C, and S, Part 86, Title 40, Code of Federal Regulations, to the extent they pertain to exhaust emission standards and test procedures, as adopted or amended on _____, 1998, are hereby adopted as the "California Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles," with the following exceptions and additions.

**PART I: GENERAL PROVISIONS FOR CERTIFICATION AND IN-USE
VERIFICATION OF EMISSIONS**

This part sets forth certification requirements and emission standards necessary to certify a passenger car, light-duty truck or medium-duty vehicle for sale in California.

A. General Applicability

1. §86.1801 Applicability.

1.1 §86.1801-01. Amend as follows:

1.1.1 Amend subparagraph (a): Except as otherwise indicated, the provisions of this subpart apply to new 2001 and later model year Otto-cycle and diesel-cycle passenger cars, light-duty trucks and medium-duty vehicles (including alternative fuel and hybrid electric vehicles) produced and delivered for sale in California. In cases where a provision applies only to a certain vehicle group based on its model year, vehicle class, motor fuel, engine type, or other distinguishing characteristics, the limited applicability is cited in the appropriate section or paragraph.

1.1.2 Delete subparagraph (b)

1.1.3 (a) Delete subparagraph (c)(1)

(b) Subparagraph (c)(2). [No change.]

1.1.4 Amend subparagraph (d) as follows: Special certification procedures are available for any manufacturer whose projected or actual combined California sales of passenger cars, light-duty trucks, medium-duty vehicles, heavy-duty vehicles and heavy-duty engines in its product line are fewer than 4,500 units based on the average number of vehicles produced and delivered for sale for the three previous consecutive model years for which a manufacturer seeks certification. For manufacturers certifying for the first time in California, model-year sales shall be based on projected California sales. To certify its light- and medium-duty vehicle product line under these optional procedures, the small-volume manufacturer must first obtain the Executive Officer's approval. The manufacturer must meet the eligibility criteria specified in 40 CFR §86.1834 before the Executive Officer's approval will be granted. The small-volume manufacturer's light- and medium-duty vehicle and truck certification procedures are described in 40 CFR §86.1834.

(e) [No change.]

2. California Provisions

2.1 References to "light-duty trucks" in 40 CFR 86 shall apply to both "light-duty trucks" and "medium-duty vehicles" in these procedures. References to "light-duty vehicles" shall apply to "passenger cars" in these procedures. References to dual fuel vehicles shall also mean bi-fuel vehicles.

2.2 Any reference to vehicle sales throughout the United States shall mean vehicle sales in California.

2.3 Regulations concerning EPA hearings, EPA inspections, specific language on the Certificate of Conformity, ~~evaporative emissions, high-altitude vehicles and testing,~~ particulate and oxides of nitrogen averaging and test group standards applicable in such averaging, alternative useful life, selective enforcement audit, Certification Short Test, and heavy-duty engines and vehicles shall not be applicable to these procedures, except where specifically noted.

2.4 Regulations both herein and in Title 40, CFR Part 86, Subparts B, C, and S, concerning Otto-cycle and diesel-cycle vehicles shall be applicable to ethanol vehicles, including dual fuel, bi-dual and fuel-flexible vehicles, except where specifically noted otherwise.

2.5 For engines used in medium-duty vehicles that are not distinctly diesel engines nor derived from such, the Executive Officer shall determine whether the engines shall be subject to diesel or Otto-cycle engine regulations, in consideration of the relative similarity of the engines' torque-speed characteristics and vehicle applications with those of Otto-cycle and diesel engines.

2.6 Regulations concerning federal OBD system requirements shall mean the California OBD requirements, except where specifically noted otherwise.

3. §86.1802 Section Numbering; Construction.

3.1 §86.1802-01. [No change.]

3.2 The section numbering convention employed in these test procedures, in order of priority, is A.1.1.1. in order to distinguish California procedures and requirements from those of the federal government. References in these test procedures to specific sections of the Code of Federal Regulations maintain the same numbering system employed in the Code of Federal Regulations.

3.3 In cases where the entire CFR section is incorporated by reference with no modifications, the notation "[No change.]" is used. In cases where there are no changes to the CFR language but there are additional California requirements, the California requirement is noted in a separate subsection with the numbering convention set forth in subparagraph 3.2, above.

B. Definitions, Acronyms and Abbreviations

1. §86.1803 Definitions

1.1 §86.1803-01 Definitions. [No change, except as otherwise noted below.]

2. California Definitions

“AB 965 vehicles” are vehicles certified pursuant to Title 13 CCR §1960.5.

"Administrator" means the Executive Officer of the Air Resources Board (ARB).

"Alcohol fuel" means either methanol or ethanol as those terms are defined in these test procedures.

“All-Electric Range Test” means a test sequence used to determine the range of an electric or hybrid electric vehicle without the use of its auxiliary power unit. The All-Electric Range Test is described in the “California Zero-Emission and Hybrid Electric Vehicle Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.”

"Battery assisted combustion engine vehicle" means any vehicle which allows power to be delivered to the driven wheels solely by a combustion engine, but which uses a battery pack to store energy which may be derived through remote charging, regenerative braking, and/or a flywheel energy storage system or other means which will be used by an electric motor to assist in vehicle operation.

“Bi-fuel vehicle” is any motor vehicle that is engineered and designed to be capable of operating on two fuels wherein the two fuels are stored on board in separate fuel tanks and metered separately, but in operation the two fuels are combusted together.

"Certificate of Conformity" means Executive Order certifying vehicles for sale in California.

"Certification" means certification as defined in Section 39018 of the Health and Safety Code.

"Certification level" means the official exhaust or evaporative emission result from an emission-data vehicle which has been adjusted by the applicable mass deterioration factor and is submitted to the Executive Officer for use in determining compliance with an emission standard for the purpose of certifying a particular test group. For those test groups that are certified using reactivity adjustment factors developed by the manufacturer pursuant to Part II, Section D of these test procedures, the exhaust NMOG certification level shall include adjustment by the ozone deterioration factor.

"Conventional gasoline" means any certification gasoline which meets the specifications of 40 CFR 86.113-94(a), but does not include the specifications of California reformulated gasoline as set forth in Part II, section 100.3.1. of these test procedures. For the purpose of determining the ozone-forming potential of conventional gasoline vehicle exhaust emissions, gasoline meeting the specifications of Part II, Section D of these test procedures shall be used.

"Dedicated Ethanol Vehicle" means any ethanol-fueled motor vehicle that is engineered and designed to be operated solely on ethanol.

"Dedicated Methanol Vehicle" means any methanol-fueled motor vehicle that is engineered and designed to be operated solely on methanol.

"Diesel Engine" means any engine powered with diesel fuel, gaseous fuel, or alcohol fuel for which diesel engine speed/torque characteristics and vehicle applications are retained.

"Dual-fuel vehicle" means any motor vehicle that is engineered and designed to be capable of operating on gasoline or diesel and on compressed natural gas or liquefied petroleum gas, with separate fuel tanks for each fuel on-board the vehicle. In operation, only one fuel is used at a time.

"Ethanol" means any fuel for motor vehicles and motor vehicle engines that is composed of either commercially available or chemically pure ethanol ($\text{CH}_3\text{CH}_2\text{OH}$) and gasoline as specified in Part II, section 100.3 (Certification Fuel Specifications) of these test procedures. The required fuel blend is based on the type of ethanol-fueled vehicle being certified and the particular aspect of the certification procedure being conducted.

"Ethanol vehicle" means any motor vehicle that is engineered and designed to be operated using ethanol as a fuel.

"Fuel-Flexible Vehicle" or **"FFV"** means any motor vehicle engineered and designed to be operated on a petroleum fuel and an alcohol fuel, or any mixture of the two. Alcohol-fueled vehicles that are only marginally functional when using gasoline (e.g., the engine has a drop in rated horsepower of more than 80 percent) are not flexible fuel vehicles.

"Heavy-duty engine" means an engine which is used to propel a heavy-duty vehicle.

"Heavy-duty vehicle" means any motor vehicle having a manufacturer's gross vehicle weight rating greater than 6,000 pounds for vehicles certifying to the standards in Section E.1.1.1 or any motor vehicle having a manufacturer's gross vehicle weight rating greater than 8,500 pounds for vehicles certifying to the standards in Section E.1.1.2, except passenger cars.

"Hybrid electric vehicle" or **"HEV"** means any vehicle which is included in the definition of a "series hybrid electric vehicle," a "parallel hybrid electric vehicle," or a "battery assisted combustion engine vehicle."

"Incomplete vehicle" means any vehicle which does not have the primary load carrying device or container attached. In situations where individual marketing relationships makes the status of the vehicle questionable, the Executive Officer shall determine whether a specific model complies with the definition of incomplete vehicle.

"Intermediate volume manufacturer" is any vehicle manufacturer with California sales between ~~3,001~~ 4,501 and 35,000 new light- and medium-duty vehicles per model year based on the average number of vehicles sold by the manufacturer each year from 1989 to 1993; however, for manufacturers certifying for the first time in California, model year sales shall be based on projected California sales.

"LEV I" refers to the low-emission vehicle standards adopted by the Board on July 12, 1991 and are set forth in Section E.1.1.1 of these test procedures.

"LEV II" refers to the standards set forth in Section E.1.1.2 of these test procedures. [These standards were adopted by the Board concurrently with the inception of these test procedures.]

"Light-duty truck" or **"LDT"** means any motor vehicle certified to the standards in Section I.E.1.1.1 rated at 6,000 pounds GVW or less or any motor vehicle certified to the standards in Section E.1.1.2 rated at 8,500 pounds GVW or less, which is designed primarily

for purposes of transportation of persons, property or is a derivative of such a vehicle, or is available with special features enabling off-street or off-highway operation and use.

"Low-emission vehicle" or "LEV" means any vehicle certified to low-emission standards.

"Medium-duty vehicle" or "MDV" means any 1995 through 2003 heavy-duty vehicle having a manufacturer's gross vehicle weight rating of 14,000 pounds or less; or any 2004 and subsequent model heavy-duty vehicle having a manufacturer's gross vehicle weight rating between 8,501 and 14,000 pounds.

"Methane Reactivity Adjustment Factor" means a factor applied to the mass of methane emissions from natural gas fueled vehicles for the purpose of determining the gasoline equivalent ozone-forming potential of the methane emissions.

"Methanol" means any fuel for motor vehicles and motor vehicle engines that is composed of either commercially available or chemically pure methanol (CH_3OH) and gasoline as specified in Part II, Section 100.3.1 (Certification Fuel Specifications) of these procedures. The required fuel blend is based on the type of methanol-fueled vehicle being certified and the particular aspect of the certification procedure being conducted.

"Natural gas vehicle" means any motor vehicle that is engineered and designed to be operated using either compressed natural gas or liquefied natural gas.

"Non-methane organic gas" (or "NMOG") means the sum of non-oxygenated and oxygenated hydrocarbons contained in a gas sample as measured in accordance with the "California Non-Methane Organic Gas Test Procedures;" incorporated by reference in Section I.D of these test procedures.

"Organic material non-methane hydrocarbon equivalent" (or "OMNMHCE") for methanol-fueled vehicles means the sum of the carbon mass contribution of non-oxygenated hydrocarbons (excluding methane), methanol, and formaldehyde as contained in a gas sample, expressed as gasoline-fueled hydrocarbons. For ethanol-fueled vehicles, "organic material non-methane hydrocarbon equivalent" (or "OMNMHCE") means the sum of carbon mass contribution of non-oxygenated hydrocarbons (excluding methane), methanol, ethanol, formaldehyde and acetaldehyde as contained in a gas sample, expressed as gasoline-fueled hydrocarbons.

"Ozone deterioration factor" means a factor applied to the mass of NMOG emissions from TLEVs, LEVs, ULEVs or SULEVs which accounts for changes in the ozone-forming potential of the NMOG emissions from a vehicle as it accumulates mileage.

"Parallel hybrid electric vehicle" means any vehicle which allows power to be delivered to the driven wheels by either a combustion engine and/or by a battery powered electric motor.

"Passenger car" or "PC" means any motor vehicle designed primarily for transportation of persons and having a design capacity of 12 persons or less.

"Reactivity adjustment factor" or "RAF" means a fraction applied to the mass of NMOG emissions from a vehicle powered by a fuel other than conventional gasoline for the purpose of determining a gasoline-equivalent NMOG emission value. The reactivity adjustment factor is defined as the ozone-forming potential of the exhaust from a vehicle powered by a fuel other than conventional gasoline divided by the ozone-forming potential of conventional gasoline vehicle exhaust.

"Series hybrid electric vehicle" means any vehicle which allows power to be delivered to the driven wheels solely by a battery powered electric motor, but which also incorporates the use of a combustion engine to provide power to the battery and/or electric motor.

"Specific reactivity" is defined as the grams of ozone created per gram of NMOG emitted. This term is also known as ozone-forming potential.

"Super-Ultra-Low-Emission Vehicle" or "SULEV" means any vehicle certified to super-ultra-low-emission standards.

"Tier 1 vehicle" means any vehicle certified to the standards in Title 13, CCR, §1960.1(f)(2) for passenger cars and light-duty trucks or to the standards in Title 13, CCR, §1960.1(h)(1) for medium-duty vehicles.

"Transitional low-emission vehicle" or "TLEV" means any vehicle certified to transitional low-emission standards.

~~—————"Type A hybrid electric vehicle" means a hybrid electric vehicle which achieves a minimum range of 60 miles in the All Electric Range Test, while maintaining minimal speed and time requirements throughout the test and without use of the auxiliary power unit.~~

~~—————"Type B hybrid electric vehicle" means a hybrid electric vehicle which achieves a range of 40 to 59 miles in the All Electric Range Test, while maintaining minimal speed and time requirements throughout the test and without use of the auxiliary power unit.~~

~~—————"Type C hybrid electric vehicle" means a hybrid electric vehicle which achieves a range of 0 to 39 miles in the All Electric Range Test, while maintaining minimal speed and time requirements throughout the test and without use of the auxiliary power unit, or which has been designated by the manufacturer as having a range of less than 40 15 miles without the use of the auxiliary power unit. This definition shall also apply to any hybrid electric vehicle which allows the operator to control the time or mode of operation of the auxiliary power unit either directly or indirectly (with the exception that a mechanism which allows the operator only to shut off the auxiliary power unit is permissible for Type A and Type B HEVs), to any hybrid electric vehicle which can be operated solely through the use of the auxiliary power unit, to any hybrid electric vehicle which utilizes a climate control system that cannot be operated without using the auxiliary power unit, and all other types of hybrid electric vehicles, excluding Type A and Type B hybrid electric vehicles.~~

"Ultra-low-emission vehicle" or "ULEV" means any vehicle certified to ultra-low emission standards.

"Zero-emission vehicle" or "ZEV" means any vehicle certified to the zero-emission standards set forth in the "California Zero-Emission and Hybrid Electric Vehicle Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Year Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated herein by reference.

3. §86.1804 Acronyms and Abbreviations

3.1 §86.1804-01 Acronyms and Abbreviations. [No change.]

3.2 California Acronyms and Abbreviations

"CCR" means California Code of Regulations

"CFR" means Code of Federal Regulations

"HEV" means hybrid-electric vehicle.

"LDT" means light-duty truck.

"LEV" means low-emission vehicle.

"LVW" means loaded vehicle weight.

"MDV" means medium-duty vehicle.

"n/a" means not applicable.

"Non-Methane Organic Gases" or "NMOG" means the total mass of oxygenated and non-oxygenated hydrocarbon emissions.

"OBD" means on-board diagnostic system.

"PC" means passenger car.

"SULEV" means super ultra-low-emission vehicle.

"TLEV" means transitional low-emission vehicle.

"ULEV" means ultra-low-emission vehicle.

C. General Requirements for Certification

1. §86.1805 Useful Life

1.1. §86.1805-01 [No change.]

1.2. Amend §86.1805-01(b) to add the following: For vehicles certified to the LEV II emission standards in Section E1.1.2 of these test procedures, full useful life is as follows:

1.2.1 For passenger cars and light-duty trucks (including hybrid electric vehicles), the useful life shall be 10 years or 120,000 miles, whichever occurs first.

1.2.2 For medium-duty vehicles (including hybrid electric vehicles), the useful life shall be 11 years or 120,000 miles, whichever occurs first.

1.2.3 For light-duty hybrid electric vehicles (HEVs), the full useful life shall be 10 years or 120,000 miles, whichever occurs first. The full useful life of the auxiliary power unit shall be defined as ~~50,000~~ 60,000 miles for ~~Type A~~ HEVs with an all-electric range greater than or equal to 35 miles, ~~75,000~~ 90,000 miles for ~~Type B~~ HEVs with an all-electric range between 21 and 34 miles, and ~~100,000~~ 120,000 miles for ~~Type C~~ HEVs with an all-electric range between 0 and 20 miles. For medium-duty HEVs, the full useful life shall be 11 years or 120,000 miles, whichever occurs first. The full useful life of the auxiliary power unit shall be defined as 60,000 miles for ~~Type A~~ HEVs with an all-electric range greater than or equal to 35 miles, 90,000 miles for ~~Type B~~ HEVs with an all-electric range between 21 and 34 miles, and 120,000 miles for ~~Type C~~ HEVs with an all-electric range between 0 and 20 miles.

1.2.4 The full useful life of SULEV passenger cars or light-duty trucks eligible to receive a to receive a partial ZEV allocation, shall be 15 years or 150,000 miles, whichever occurs first.

2. §86.1806 On-Board Diagnostics

2.1. §86.1806-01. Delete.

2.2. **California On-Board Diagnostic System Requirements.** All vehicles produced and delivered for sale in California shall be subject to the provisions of Section 1968.1, Title 13, CCR. No vehicle shall be certified unless the Executive Officer finds that the vehicle complies with the requirements of Section 1968.1.

3. §86.1807 Vehicle Labeling

3.1. §86.1807-01. [No change.]

3.2. **California Labeling Requirements.** In addition to the federal requirements set forth in §86.1808, labeling shall conform with the requirements specified in Title 13, CCR, §1965, and the "California Motor Vehicle Emission Control and Smog Index Label Specifications." In cases where there is conflict with the federal label specifications the California requirements shall apply.

4. §86.1808 Maintenance Instructions

4.1. §86.1808-01. [No change.]

5. §86.1809 Prohibition of Defeat Devices

5.1. §86-1809-01. [No change.]

5.2 Emission Control System Continuity at Low Temperature. For each test group certified to TLEV, LEV, ULEV, or SULEV standards, the manufacturer shall submit with the Part I certification application, an engineering evaluation demonstrating that a discontinuity in emissions of non-methane organic gases, carbon monoxide, oxides of nitrogen and formaldehyde measured on the Federal Test Procedure (40 CFR Part 86) does not occur in the temperature range of 20°F to 86°F. For diesel vehicles, the engineering evaluation shall also include particulate emissions.

D. §86.1810 General standards; increase in emissions; unsafe conditions; waivers

1. §86.1810-01; §86.1810-04. Amend §§86.1810-01 and 86.1811-04 as follows:

This section applies to model year 2001 and later light-duty vehicles and light-duty trucks fueled by gasoline, diesel, methanol, ethanol, natural gas and liquefied petroleum gas fuels. Multi-fueled vehicles (including bi-fueled, dual-fueled and flexible-fueled vehicles) shall comply with all requirements established for each consumed fuel (or blend of fuels in the case of flexible-fueled vehicles). The standards of this subpart apply to both certification and in-use vehicles unless otherwise indicated.

(a) through (d) [No change.]

(e) On-board diagnostics. Delete and replace with:

All passenger cars, light-duty trucks and medium-duty vehicles must have an on-board diagnostic system as described in Title 13, CCR, Section 1968.1.

(f) through (g) [No change.]

(h) [See D.1.1 below.]

(i) **Supplemental FTP general provisions.** [See Section D.2. below]

(j) **Evaporative emissions general provisions.** [The provisions of this section are set forth in the "California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Motorcycles."]

(k) through (n) [The provisions of these sections are set forth in the "California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles."]

1.1 Measurement of Hydrocarbon Emissions.

1.1.1 Except as otherwise indicated in these test procedures, for vehicles fueled by gasoline, methanol, ethanol, natural gas, or liquefied petroleum, hydrocarbon standards shall mean non-methane organic gases (NMOG) and shall be measured in accordance with the "California Non-Methane Organic Gas Test Procedures" as incorporated by reference herein.

1.1.2 For diesel vehicles, NMOG shall mean non-methane hydrocarbons and shall be measured in accordance with Part B of the "California Non-Methane Organic Gas Test Procedures."

1.1.3 For vehicles certifying to the SFTP standards as set forth in Section E.1.2.1 of these test procedures, hydrocarbon emissions shall be measured in accordance with the "California Non-Methane Hydrocarbon Test Procedures," as last amended May 15, 1990, which is incorporated herein by reference, for PCs and LDTs certified to the Tier 1 exhaust standards and in accordance with Part B (Determination of Non-Methane Hydrocarbon Mass Emissions by Flame Ionization Detection) of the "California Non-Methane Organic Gas Test Procedures" for PCs and LDTs certified as TLEVs. For alcohol-fueled vehicles certifying to the standards in Section E.1.2.1., "Non-Methane Hydrocarbons" shall mean "Organic Material Non-Methane Hydrocarbon Equivalent."

2. **Supplemental FTP general provisions for California.**

2.1 Amend 40 CFR §86.1810-01(i) and §86.1810-04(i) as follows:

2.1.1 Delete subparagraphs (1) through (3) [The implementation schedules for SFTP are set forth in Section E.2 of these test procedures.]

2.1.2 Subparagraph (4) [No change.]

2.1.3 Subparagraph (5) [No change.]

2.1.4 Delete subparagraph (6); replace with: **Air to Fuel Ratio**

Requirement. With the exception of cold-start conditions, warm-up conditions and rapid-throttle motion conditions ("tip-in" or "tip-out" conditions), the air to fuel ratio shall not be richer at any time than, for a given engine operating condition (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters), the leanest air to fuel mixture required to obtain maximum torque (lean best torque) with a tolerance of six percent of the fuel consumption. The Executive Officer may approve a manufacturer's request for approval to use additional enrichment in subsequent testing if the manufacturer demonstrates that additional enrichment is needed to protect the vehicle, occupants, engine, or emission control hardware.

2.1.5 Delete subparagraph (7); replace with: **Single Roll Electric**

Dynamometer Requirement. For all vehicles certified to the SFTP standards, a single-roll electric dynamometer or a dynamometer which produces equivalent results, as set forth in 40 CFR §86.108-00, must be used for all types of emission testing to determine compliance with the applicable emission standards.

2.1.6 Delete subparagraph (8); replace with: **Small volume provisions.**

Small volume manufacturers of PCs, LDTs, and MDVs shall certify 100% of their PC and LDT fleet in 2004 and subsequent model years, and 100% of their MDV fleet in 2005 and subsequent model years.

2.1.7. Subparagraph (9) [No change.]

2.1.8. Subparagraph (10) [No change.]

2.1.9. Subparagraph (11) [No change.]

2.2 **A/C-on Specific Calibrations.** A manufacturer may use A/C-on specific calibrations (e.g. air to fuel ratio, spark timing, and exhaust gas recirculation), which differ from A/C-off calibrations for given engine operating conditions (e.g., engine speed, manifold pressure, coolant temperature, air charge temperature, and any other parameters). Such calibrations must not unnecessarily reduce the NMHC+NO_x emission control effectiveness during A/C-on operation when the vehicle is operated under conditions which may reasonably be expected to be encountered during normal operation and use. If reductions in control system NMHC+NO_x effectiveness do occur as a result of such calibrations, the manufacturer shall, in the Application for Certification, specify the circumstances under which such reductions do occur, and the reason for the use of such calibrations resulting in such reductions in control system effectiveness. A/C-on specific "open-loop" or "commanded enrichment" air-fuel enrichment strategies (as defined below), which differ from A/C-off "open-loop" or "commanded enrichment" air-fuel enrichment strategies, may not be used, with the following exceptions: cold-start and warm-up conditions, or, subject to Executive Officer approval, conditions requiring the protection of the vehicle, occupants, engine, or

emission control hardware. Other than these exceptions, such strategies which are invoked based on manifold pressure, engine speed, throttle position, or other engine parameters shall use the same engine parameter criteria for the invoking of this air-fuel enrichment strategy and the same degree of enrichment regardless of whether the A/C is on or off. "Open-loop" or "commanded" air-fuel enrichment strategy is defined as enrichment of the air to fuel ratio beyond stoichiometry for the purposes of increasing engine power output and the protection of engine or emissions control hardware. However, "closed-loop biasing," defined as small changes in the air-fuel ratio for the purposes of optimizing vehicle emissions or driveability, shall not be considered an "open-loop" or "commanded" air-fuel enrichment strategy. In addition, "transient" air-fuel enrichment strategy (or "tip-in" and "tip-out" enrichment), defined as the temporary use of an air-fuel ratio rich of stoichiometry at the beginning or duration of rapid throttle motion, shall not be considered an "open-loop" or "commanded" air-fuel enrichment strategy.

2.3 "Lean-On-Cruise" Calibration Strategies. In the Application for Certification, the manufacturer shall state whether any "lean-on-cruise" strategies are incorporated into the vehicle design. A "lean-on-cruise" air-fuel calibration strategy is defined as the use of an air-fuel ratio significantly greater than stoichiometry, during non-deceleration conditions at speeds above 40 mph. "Lean-on-cruise" air-fuel calibration strategies shall not be employed during vehicle operation in normal driving conditions, including A/C-usage, unless at least one of the following conditions is met:

1. Such strategies are substantially employed during the FTP or SFTP, or
2. Such strategies are demonstrated not to significantly reduce vehicle NMHC + NOx emissions control effectiveness over the operating conditions in which they are employed, or
3. Such strategies are demonstrated to be necessary to protect the vehicle, occupants, engine, or emissions control hardware.

If the manufacturer proposes to use a "lean-on-cruise" calibration strategy, the manufacturer shall specify the circumstances under which such a calibration would be used, and the reason or reasons for the proposed use of such a calibration.

The above provisions shall not apply to vehicles powered by "lean-burn" engines or Diesel-cycle engines. A "lean-burn" engine is defined as an Otto-cycle engine designed to run at an air-fuel ratio significantly greater than stoichiometry during the large majority of its operation.

E. California Exhaust Emission Standards

Delete 40 CFR §§86.1811- through 86.1815. The following section contains the exhaust emission standards, phase-in requirements and reactivity adjustment factors applicable to passenger cars, light-duty trucks and medium-duty vehicles produced and delivered for sale in California. Manufacturers shall demonstrate compliance with the exhaust standards applicable to specific test groups as well as with the composite phase-in requirements applicable to their entire fleet. Manufacturers have the option of certifying engines used in incomplete and diesel MDVs with a gross vehicle weight rating of greater than 8,500 lbs. to the heavy-duty engine standards and test procedures set forth in Title 13, CCR, Section 1956.8(h).

1. Exhaust Emission Standards

1.1 FTP Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

The exhaust emission standards set forth in this section refer to the exhaust emitted over the driving schedule set forth in Title 40, CFR, Subparts B and C, except as amended in these test procedures.

1.1.1 LEV I Exhaust Standards. The following standards represent the maximum exhaust emissions for the intermediate and full useful life from new 2001 through 2003 model-year Tier 1 passenger cars and light-duty trucks; 2001 through 2002 model year Tier 1 medium-duty vehicles; and 2001 through 2006 model year TLEVs, LEVs, and ULEVs in the light- and medium-duty vehicle classes and 2001 through 2006 model year SULEVs in the medium-duty vehicle classes, including fuel-flexible and dual fuel vehicles when operating on the gaseous or alcohol fuel they are designed to use:

Exhaust Mass Emission Standards for New 2001 - 2003 Model Year Tier 1 Vehicles and 2001 - 2006 Model Year TLEVs, LEVs, and ULEVs in the Passenger Car and Light-Duty Truck Vehicle Classes; 2001-2002 Model Year Tier 1 Medium-Duty Vehicles; and 2001-2006 Model Year LEV, ULEV and SULEV Medium-Duty Vehicles							
Vehicle Type	Durability Vehicle Basis(mi.)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Diesel Particulate* (g/mi)
All PCs; LDTs (0-3750 lbs. LVW)	50,000	Tier 1	0.25	3.4	0.4	n/a	0.08
		TLEV	0.125	3.4	0.4	15	n/a
		LEV	0.075	3.4	0.2	15	n/a
		ULEV	0.040	1.7	0.2	8	n/a
	100,000	Tier 1	0.31	4.2	0.6	n/a	n/a
		TLEV	0.156	4.2	0.6	18	0.08
		LEV	0.090	4.2	0.3	18	0.08

Vehicle Type	Durability Vehicle Basis(mi.)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Diesel Particulate* (g/mi)
		ULEV	0.055	2.1	0.3	11	0.04

Vehicle Type	Durability Vehicle Basis(mi.)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Diesel Particulate* (g/mi)
LDTs (3751-5750 lbs. LVW)	50,000	Tier 1	0.32	4.4	0.7	n/a	0.08
		TLEV	0.160	4.4	0.7	18	n/a
		LEV	0.100	4.4	0.4	18	n/a
		ULEV	0.050	2.2	0.4	9	n/a
	100,000	Tier 1	0.40	5.5	0.97	n/a	n/a
		TLEV	0.200	5.5	0.9	23	0.10
		LEV	0.130	5.5	0.5	23	0.10
		ULEV	0.070	2.8	0.5	13	0.05
MDVs (3751-5750 lbs. ALVW)	50,000	Tier 1	0.32	4.4	0.7	18	n/a
		LEV	0.160	4.4	0.4	18	n/a
		ULEV	0.100	4.4	0.4	9	n/a
		SULEV	0.050	2.2	0.2	9	n/a
	120,000	Tier 1	0.46	6.4	0.98	n/a	0.10
		LEV	0.230	6.4	0.6	27	0.10
		ULEV	0.143	6.4	0.6	13	0.05
		SULEV	0.072	3.2	0.3	13	0.05
MDVs (5751-8500 lbs. ALVW)	50,000	Tier 1	0.39	5.0	1.1	22	n/a
		LEV	0.195	5.0	0.6	22	n/a
		ULEV	0.117	5.0	0.6	11	n/a
		SULEV	0.059	2.5	0.3	6	n/a
	120,000	Tier 1	0.56	7.3	1.53	n/a	0.12
		LEV	0.280	7.3	0.9	32	0.12
		ULEV	0.167	7.3	0.9	16	0.06
		SULEV	0.084	3.7	0.45	8	0.06

Vehicle Type	Durability Vehicle Basis(mi.)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Diesel Particulate* (g/mi)
MDVs 8501 -10,000 lbs. ALVW	50,000	Tier 1	0.46	5.5	1.3	28	n/a
		LEV	0.230	5.5	0.7	28	n/a
		ULEV	0.138	5.5	0.7	14	n/a
		SULEV	0.069	2.8	0.35	7	n/a
	120,000	Tier 1	0.66	8.1	1.81	n/a	0.12
		LEV	0.330	8.1	1.0	40	0.12
		ULEV	0.197	8.1	1.0	21	0.06
		SULEV	0.100	4.1	0.5	10	0.06
MDVs 10,001-14,000 lbs. ALVW	50,000	Tier 1	0.60	7.0	2.0	36	n/a
		LEV	0.300	7.0	1.0	36	n/a
		ULEV	0.180	7.0	1.0	18	n/a
		SULEV	0.09	3.5	0.5	9	n/a
	120,000	Tier 1	0.86	10.3	2.77	n/a	n/a
		LEV	0.430	10.3	1.5	52	0.12
		ULEV	0.197	10.3	1.5	26	0.06
		SULEV	0.130	5.2	0.7	13	0.06

* Particulate standards are determined on a 50,000 mile basis for Tier 1 passenger cars and light-duty trucks, on a 100,000 mile basis for passenger cars and light-duty trucks and on a 120,000 mile basis for medium-duty vehicles.

1.1.2 LEV II Exhaust Standards. The following standards represent the maximum exhaust emissions for the intermediate and full useful life from new 2001 and subsequent model-year TLEVs, LEVs, ULEVs, and SULEVs, including fuel-flexible, bi-fuel and dual fuel vehicles when operating on the gaseous or alcohol fuel they are designed to use:

Exhaust Mass Emission Standards for New 2001 and Subsequent Model TLEVs, LEVs, ULEVs, and SULEVs in the Passenger Car, Light-Duty Truck and Medium-Duty Vehicle Classes							
Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Diesel Particulate (g/mi)
All PCs; LDTs 0-7,300 lbs. LVW (Vehicles under 8,500 lbs. GVW)	50,000	TLEV	0.125	3.4	0.4	15	n/a
		LEV	0.075	3.4	0.05	15	n/a
		ULEV	0.040	1.7	0.05	8	n/a
	120,000	TLEV	0.156	4.2	0.6	18	0.04
		LEV	0.090	4.2	0.07	18	0.01
		ULEV	0.055	2.1	0.07	11	0.01
		SULEV	0.010	1.0	0.02	4	0.01
	150,000 (Optional see subpara- graphs 2 and 3 below)	TLEV	0.156	4.2	0.6	18	0.04
		LEV	0.090	4.2	0.07	18	0.01
		ULEV	0.055	2.1	0.07	11	0.01
		SULEV ³	0.010	1.0	0.02	4	0.01
MDVs 8500-10,000 lbs. GVWR The standards in this group are preliminary estimates.	50,000	LEV	0.195 <u>0.160</u>	5.0 <u>4.4</u>	0.6 <u>0.1</u>	22	n/a
		ULEV	0.117 <u>0.100</u>	5.0 <u>4.4</u>	0.6 <u>0.1</u>	11	n/a
		SULEV	0.059 <u>0.050</u>	2.5 <u>2.2</u>	0.3 <u>0.05</u>	6	n/a
	120,000	LEV	0.280 <u>0.230</u>	7.3 <u>6.4</u>	0.9 <u>0.2</u>	32	0.12
		ULEV	0.167 <u>0.143</u>	7.3 <u>6.4</u>	0.9 <u>0.2</u>	16	0.06
		SULEV	0.084 <u>0.072</u>	3.7 <u>3.2</u>	0.45 <u>0.07</u>	8	0.06
	150,000 ⁽²⁾ (Optional, see subpara- graphs 2 and 3 below)	LEV	<u>0.230</u>	<u>6.4</u>	<u>0.2</u>	32	0.12
		ULEV	<u>0.143</u>	<u>6.4</u>	<u>0.2</u>	16	0.06
		SULEV	<u>0.072</u>	<u>3.2</u>	<u>0.07</u>	8	0.06

Vehicle Type	Durability Vehicle Basis (mi)	Vehicle Emission Category	NMOG (g/mi)	Carbon Monoxide (g/mi)	Oxides of Nitrogen (g/mi)	Formaldehyde (mg/mi)	Diesel Particulate (g/mi)
MDVs 10,001-14,000 lbs. GVWR The standards in this section are preliminary estimates.	50,000	LEV	0.230 <u>0.195</u>	5.5 <u>5.0</u>	0.7 <u>0.3</u>	28	n/a
		ULEV	0.138 <u>0.117</u>	5.5 5.0	0.7 <u>0.3</u>	14	n/a
		SULEV	0.069 <u>0.059</u>	2.8 2.5	0.35 <u>0.2</u>	7	n/a
	120,000	LEV	0.330 <u>0.280</u>	8.1 <u>7.3</u>	1.0 <u>0.5</u>	40	0.12
		ULEV	0.197 <u>0.167</u>	8.1 <u>7.3</u>	1.0 <u>0.5</u>	21	0.06
		SULEV	0.100 <u>0.084</u>	4.1 <u>3.7</u>	0.5 <u>0.2</u>	10	0.06

(1) Particulate standards are only applicable to diesel vehicles and shall be determined on a 120,000 mile basis.

(2) **Optional 150,000 Mile Standards.** A manufacturer may certify to these optional standards and receive additional NMOG fleet average credit as set forth in Section I.E.2.1 or additional vehicle equivalent credits as set forth in I.E.3.2 of these test procedures provided that the manufacturer extends the warranty on high cost parts to 8 years or 100,000 miles, whichever occurs first, and agrees to extend the limit on high mileage in-use testing to 105,000 miles.

(3) **Partial ZEV Allocation for SULEVs.** PCs and LDTs certifying to the optional 150,000 mile SULEV standards may also be eligible to receive a partial ZEV allocation according to the criteria set forth in Section D.2 of the “California Zero-Emission and Hybrid Electric Vehicle Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles;”

1.2. Supplemental Federal Test Procedure Exhaust Emission Standards for Light- and Medium-Duty Vehicles.

1.2.1 The maximum Supplemental Federal Test Procedure (SFTP) exhaust emission levels from new 2001 and subsequent model Tier 1 and TLEV passenger cars and light-duty trucks shall not exceed:

**SFTP EXHAUST EMISSION STANDARDS FOR 2001 AND SUBSEQUENT
MODEL-YEAR TIER 1 AND TLEV PASSENGER CARS AND LIGHT-DUTY
TRUCKS**
(grams per mile)

<u>Vehicle Type</u>	<u>Loaded Vehicle Weight (lbs.)</u>	<u>Durability Vehicle Basis (mi)</u>	<u>Fuel Type</u>	<u>NMHC + NOx Composite</u>	<u>CO</u>		
					<u>A/C Test</u>	<u>US06 Test</u>	<u>Composite Option</u>
PC	All	50,000	Gasoline	0.65	3.0	9.0	3.4
			Diesel	1.48	n/a	9.0	3.4
		100,000	Gasoline	0.91	3.7	11.1	4.2
			Diesel	2.07	n/a	11.1	4.2
LDT	0-3750	50,000	Gasoline	0.65	3.0	9.0	3.4
			Diesel	1.48	n/a	9.0	3.4
		100,000	Gasoline	0.91	3.7	11.1	4.2
			Diesel	2.07	n/a	11.1	4.2
LDT	3751-5750	50,000	Gasoline	1.02	3.9	11.6	4.4
			Diesel	n/a	n/a	n/a	n/a
		100,000	Gasoline	1.37	4.9	14.6	5.5
			Diesel	n/a	n/a	n/a	n/a

1.2.2 The following standards represent the maximum SFTP exhaust emissions at 4,000 miles for new 2001 and subsequent model LEVs, ~~and ULEVs, and~~ SULEVs in the passenger car and light-duty truck class, and new 2003 and subsequent medium-duty LEVs, ULEVs and SULEVs less than 8,500 pounds gross vehicle weight rating:

**SFTP EXHAUST EMISSION STANDARDS
FOR LEVS, ULEVS, AND SULEVS IN THE PASSENGER CAR, LIGHT-DUTY
TRUCK, AND MEDIUM-DUTY VEHICLE CLASSES**
(grams per mile)

<u>Vehicle Type</u>	<u>LVW/ALVW (lbs.)</u>	<u>US06 Test*</u>		<u>A/C Test*</u>	
		<u>NMHC + NO_x</u>	<u>CO</u>	<u>NMHC + NO_x</u>	<u>CO</u>
PC	All	0.14	8.0	0.20	2.7
LDT	0-3750 lbs.(LVW)	0.14	8.0	0.20	2.7
LDT	3751-5750 lbs. (LVW)	0.25	10.5	0.27	3.5
MDV	3751-5750 lbs. (ALVW)	0.40	10.5	0.31	3.5
MDV	5751-8500 lbs. (ALVW)	0.60	11.8	0.44	4.0

* For certification purposes, testing shall be conducted at ± 250 miles or at the mileage determined by the manufacturer for emission-data vehicles. ~~-, according to 40 CFR 86.1826-00.-~~

1.3. NMOG Standards for Fuel-Flexible, Bi-Fuel and Dual-Fuel Vehicles Operating on Gasoline.

For fuel-flexible and dual-fuel PCs, LDTs and MDVs, compliance with the NMOG exhaust mass emission standards shall be based on exhaust emission tests both when the vehicle is operated on the gaseous or alcohol fuel it is designed to use, and when the vehicle is operated on gasoline. Manufacturers shall demonstrate compliance with the applicable exhaust mass emission standards for NMOG, CO, NO_x and formaldehyde set forth in the tables in Section E.1.1 when certifying the vehicle for operation on the gaseous or alcohol fuel.

The following standards represent the maximum NMOG emissions when the vehicle is operating on gasoline. A manufacturer shall not apply a reactivity adjustment factor to the exhaust NMOG mass emission result when operating on gasoline. Testing at 50EF shall not be required for fuel-flexible, bi-fuel and dual-fuel vehicles when operating on gasoline. The applicable CO, NO_x and formaldehyde standards are set forth in Section E.1.1 above.

1.3.1 LEV I Standards for 2001 through 2006 Model Year Fuel-Flexible and Dual Fuel Vehicles Operating on Gasoline. The applicable exhaust mass emission standards for NMOG when certifying the vehicle for operation on gasoline (as specified in Part II, Section A. paragraph 100.3.1) are:

NMOG Standards for Fuel-Flexible and Dual-Fuel Vehicles Operating on Gasoline (g/mi)			
Vehicle Type, LVW/ALVW	Emission Category	Durability Vehicle Basis	
		50,000 mi	100,000 mi
All PCs, LDTs, 0-3750 lbs. LVW	TLEV	0.25	0.31
	LEV	0.125	0.156
	ULEV	0.075	0.090
LDTs, 3751-5750 lbs. LVW	TLEV	0.32	0.40
	LEV	0.160	0.200
	ULEV	0.100	0.130
MDVs, 3751-5750 lbs. ALVW	LEV	0.32	0.46
	ULEV	0.160	0.230
	SULEV	0.100	0.143
MDVs, 5751-8500 lbs. ALVW	LEV	0.39	0.56
	ULEV	0.195	0.280
	SULEV	0.117	0.167

Vehicle Type, LVW/ALVW	Emission Category	Durability Vehicle Basis	
		50,000 mi	100,000 mi
MDVs, 8501-10,000 lbs. ALVW	LEV	0.46	0.66
	ULEV	0.230	0.330
	SULEV	0.138	0.197
MDVs, 10,001-14,000 lbs. ALVW	LEV	0.60	0.86
	ULEV	0.300	0.430
	SULEV	0.180	0.257

1.3.2 LEV II Standards for 2001 and Subsequent Model Year Fuel-Flexible and Dual Fuel Vehicles Operating on Gasoline. The applicable exhaust mass emission standards for NMOG when certifying the vehicle for operation on gasoline (as specified in Part II, Section A. paragraph 100.3.1) are:

NMOG Standards for Fuel-Flexible and Dual-Fuel Vehicles Operating on Gasoline (g/mi)			
Vehicle Type (LVW/ALVW)	Vehicle Emission Category	Durability Vehicle Basis	
		50,000 mi	120,000 mi
All PCs; LDTs, 0-7300 lbs. LVW	TLEV	0.25	0.31
	LEV	0.125	0.156
	ULEV	0.075	0.090
	SULEV	0.010	0.040
MDVs, 8500-10,000 lbs. GVWR	LEV	0.195	0.280
	ULEV	0.117	0.167
	SULEV	0.059	0.084
MDVs, 10,000-14,000 lbs. GVWR	LEV	0.230	0.330
	ULEV	0.138	0.197
	SULEV	0.069	0.100

1.4. 50°F Exhaust Emission Standards.

All light- and medium-duty TLEVs, LEVs, ULEVs and SULEVs shall demonstrate compliance with the following exhaust emission standards for NMOG measured on the FTP (40 CFR, Part 86, Subpart B) conducted at a nominal test temperature of 50°F, as modified by Part II, Section C of these test procedures. The NMOG mass emission result shall be multiplied by the applicable reactivity adjustment factor, if any, prior to comparing to the applicable adjusted 50,000 mile certification standards set forth in subparagraphs 1.4.1 and 1.4.2 below. Emissions of CO, NO_x and formaldehyde measured at 50°F shall not exceed the standards set forth in Section E.1.1 applicable to vehicles of the same emission category and vehicle type subject to a cold soak and emission test at 68° to 86°F. ~~Hybrid electric, n~~ Natural gas and diesel-fueled vehicles are exempt from the 50° F test requirements.

1.4.1. NMOG Standards for Vehicles Certified to the LEV I Standards.

50°F NMOG Exhaust Emission Standards (g/mi)				
Vehicle Weight Class	Vehicle Emission Category			
	TLEV	LEV	ULEV	SULEV
PCs; LDTs 0-3750 lbs. LVW	0.25	0.150	0.080	n/a
LDTs 3751-5750 lbs. LVW	0.312	0.180	0.110	n/a
MDVs 3751-5750 lbs. ALVW	n/a	0.320	0.200	0.100
MDVs 5751-8500 lbs. ALVW	n/a	0.390	0.234	0.118
MDVs 8501-10,000 lbs. ALVW	n/a	0.460	0.276	0.138
MDVs 10,001-14,000 lbs. ALVW	n/a	0.600	0.360	0.180

1.4.2 NMOG Standards for Vehicles Certified to the LEV II Standards

50°F NMOG Exhaust Emission Standards (g/mi)				
Vehicle Weight Class	Vehicle Emission Category			
	TLEV	LEV	ULEV	SULEV
PCs; LDTs 0-3750 lbs. LVW	0.25	0.150	0.080	0.02
LDTs 3751-7300 lbs. LVW	0.312	0.180	0.110	0.02
MDVs 8500-10,000 lbs. GVWR	n/a	0.320	0.200	0.100
MDVs 10,001-14,000 lbs. GVWR	n/a	0.390	0.234	0.118

1.5. Cold CO Standards.

These standards are applicable to vehicles tested in accordance with 40 CFR Part 86 Subpart C, as modified in Part II, Section B of these test procedures at a nominal temperature of 20°F (-7°C). Natural gas vehicles, diesel-fueled vehicles, ~~hybrid electric vehicles~~ and medium-duty vehicles with a gross vehicle weight rating greater than 8,500 lbs. are exempt from these standards.

1.5.1 The following standards represent the 50,000 mile cold temperature exhaust carbon monoxide emission levels from new 2001 and subsequent model-year passenger cars, light-duty trucks, and medium-duty vehicles:

**2001 AND SUBSEQUENT MODEL-YEAR COLD TEMPERATURE
CARBON MONOXIDE EXHAUST EMISSIONS STANDARDS FOR PASSENGER
CARS, LIGHT-DUTY TRUCKS, AND MEDIUM-DUTY VEHICLES**
(grams per mile)

Vehicle Type	Carbon Monoxide
All PCs, LDTs 0-3750 lbs. LVW	10.0
LDTs, 3751-7300 lbs. LVW; MDVs, < 8,500 lbs. GVWR	12.5

1.6. Highway NO_x Standard.

The maximum emissions of oxides of nitrogen measured on the federal Highway Fuel Economy Test (HWFET; 40 CFR 600 Subpart B, which is incorporated herein by reference as amended _____) shall not be greater than 1.33 times the applicable PC and LDT standards or 2.0 times the applicable MDV standards set forth in section E.1.1. Both the projected emissions and the HWFET standard shall be rounded in accordance with ASTM E29-67 to the nearest 0.1 g/mi (or 0.01 g/mi for vehicles certified to the 0.05 or 0.02 g/mi NO_x standards) before being compared.

2. Manufacturer Phase-In Requirements for Emission Standards .

2.1. Fleet Average NMOG Requirements for Passenger Cars and Light-Duty Trucks. The fleet average non-methane organic gas exhaust mass emission values from the passenger cars and light-duty trucks produced and delivered for sale in California by a manufacturer each model year shall not exceed:

FLEET AVERAGE NON-METHANE ORGANIC GAS EXHAUST MASS EMISSION REQUIREMENTS FOR LIGHT-DUTY VEHICLE WEIGHT CLASSES (50,000 mile Durability Vehicle Basis)		
Model Year	Fleet Average NMOG (grams per mile)	
	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751-5750 lbs. LVW
2001	0.070	0.098
2002	0.068	0.095
2003	0.062	0.093
	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751-7300 lbs. LVW
2004	0.053	0.085
2005	0.049	0.076
2006	0.046	0.062
2007	0.043	0.055
2008	0.040	0.050
2009	0.038	0.047
2010+	0.035	0.043

2.1.2. Calculation of Fleet Average NMOG Value. Each manufacturer's fleet average NMOG value for the total number of PCs and LDTs produced and delivered for sale in California shall be calculated as follows:

$$\frac{3 \text{ [Number of vehicles in a test group} \times \text{applicable emission standard]} + 3 \text{ [Number of hybrid electric vehicles in a test group} \times \text{HEV NMOG factor]}}{\text{Total number of vehicles in test group}}$$

Total Number of Vehicles Produced, Including ZEVs¹ and HEVs

The applicable emission standards to be used in the above equation are as follows:

Model Year	Emission Category	Emission Standard Value	
		All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751-5750 lbs. LVW
2001 and subsequent	Tier 1 (AB 965 vehicles only)	0.25	0.31
2001 - 2003	Tier 1	0.25	0.31
2001 - 2006 model year vehicles certified to the "LEV I" standards in E.1.1.1	TLEVs	0.125	0.160
	LEVs	0.075	0.100
	ULEVs	0.040	0.050
Model Year	Emission Category	All PCs; LDTs 0-3750 lbs. LVW	LDTs 3751-7300 lbs. LVW
2001 and subsequent model year vehicles certified to the "LEV II" standards in E.1.1.2	TLEVs	0.125	0.125
	LEVs	0.075	0.075
	ULEVs	0.040	0.040
	SULEVs	0.01	0.01
2001 and subsequent model year vehicles certified to the optional 150,000 mile "LEV II" standards for PCs and LDTs in E.1.1.2	TLEVs	0.11	0.11
	LEVs	0.06	0.06
	ULEVs	0.03	0.03

2.1.3 HEV NMOG Factor. The HEV NMOG factor for light-duty vehicles is calculated as follows:

$$\text{LEV HEV Contribution Factor} = 0.075 - [(\text{Zero-emission VMT Factor}) \times 0.035]$$

$$\text{ULEV HEV Contribution Factor} = 0.040 - [(\text{Zero-emission VMT Factor}) \times 0.030]$$

¹

ZEVs classified as LDTs (>3750 lbs. LVW) that have been counted toward the ZEV requirement for PCs and LDTs (0-3750 lbs. LVW) as specified in Section C of the "California Zero-Emission and Hybrid Electric Vehicle Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles" shall be included in this equation.

where Zero-emission VMT Factor for HEVs is determined in accordance with Section D.2.2.1 of the “California Zero-Emission and Hybrid Electric Vehicle Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Year Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles.”

2.1.4. Requirements for Small Volume Manufacturers. In 2001 through 2003 model years, a small volume manufacturer shall not exceed a fleet average NMOG value of 0.075 g/mi for PCs and LDTs from 0-3750 lbs. LVW or 0.100 g/mi for LDTs from 3751-5750 lbs. LVW calculated in accordance with subparagraph E.2.1.2. In 2004 and subsequent model years, a small volume manufacturer shall not exceed a fleet average NMOG value of 0.075 for PCs and LDTs from 0-3750 lbs. LVW or 0.075 for LDTs from 0-7300 lbs. LVW calculated in accordance with subparagraph E.2.1.2. In 2007 and subsequent model years, a small volume manufacturer shall not certify vehicles to the standards in Section E.1.1.1.

2.2 Medium-Duty Vehicle Phase-In Requirements. A manufacturer of MDVs shall certify an equivalent percentage of its MDV fleet according to the following phase-in schedule:

Model Year	Vehicles Certified to Section I.E.1.1 (%)			Vehicles Certified to Title 13 CCR Section 1956.8(g) or (h) (%)		
	LEV	ULEV	<u>SULEV</u>	Tier 1	LEV	ULEV
2001	80	20	<u>0</u>	100	0	0
2002	70	30	<u>0</u>	0	100	0
2003	60	40	<u>0</u>	0	100	0
2004 +	60 40	40	<u>20</u>	0	0	100

2.2.1 For the 2001 and subsequent model years, each manufacturer's MDV fleet shall be defined as the total number of California-certified MDVs from 3751-14,000 lbs. ALVW produced and delivered for sale in California. The percentages shall be applied to the manufacturers' total production of California-certified medium-duty vehicles delivered for sale in California.

2.2.2 Requirements for Small Volume Manufacturers. In 2001 and subsequent model years, a small volume manufacturer shall certify, produce, and deliver for sale in California LEVs in a quantity equivalent to 100% of their MDV fleet.

2.3 Implementation Schedules for SFTP Emission Standards

2.3.1 A manufacturers of PCs and of LDTs certified to the Tier 1 and TLEV standards as set forth in Section E.1 of these test procedures, except a small volume manufacturer, shall certify a minimum percentage of its PC and LDT fleet according to the following phase-in schedule.

Model Year	Percentage of PC and LDT Fleet
2001	25
2002	50
2003	85
2004 and subsequent	100

(a) For the purposes of the implementation schedule set forth in this subparagraph 2.3.1, each manufacturer's PC and LDT fleet shall be defined as the total projected number of Tier 1 and TLEV PCs and LDTs from 0-5750 lbs. LVW sold in California. As an option, a manufacturer may elect to have its total PC and LDT fleet defined, for the purposes of this implementation schedule only, as the total projected number of the manufacturer's PCs and LDTs, other than zero-emission vehicles, certified and sold in California.

2.3.2 (a) A manufacturer of PCs, LDTs, and MDVs certified to the LEV, ULEV and SULEV standards as set forth in Section E.1 of these test procedures, except a small volume manufacturer, shall certify a minimum percentage of its PC and LDT fleet, and a minimum percentage of its MDV fleet, according to the following phase-in schedule.

Model Year	Percentage	
	PC, LDT	MDV
2001	25	NA
2002	50	NA
2003	85	25
2004	100	50
2005 and subsequent	100	100

(b) A manufacturer may use an "Alternative or Equivalent Phase-in Schedule" to comply with the phase-in requirements. An "Alternative Phase-in" is one that achieves at least equivalent emission reductions by the end of the last model year of the scheduled phase-in. Model-year emission reductions shall be calculated by multiplying the percent of vehicles (based on the manufacturer's projected California sales volume of the applicable vehicle fleet) meeting the new requirements per model year by the number of model years implemented prior to and including the last model year of the scheduled phase-in. The "cumulative total" is the summation of the model-year emission reductions (e.g., a four model-year 25/50/85/100 percent phase-in schedule would be calculated as: $(25\% * 4 \text{ years}) + (50\% * 3 \text{ years}) + (85\% * 2 \text{ years}) +$

($100\% * 1 \text{ year} = 520$). Any alternative phase-in that results in an equal or larger cumulative total than the required cumulative total by the end of the last model year of the scheduled phase-in shall be considered acceptable by the Executive Officer under the following conditions: 1) all vehicles subject to the phase-in shall comply with the respective requirements in the last model year of the required phase-in schedule and 2) if a manufacturer uses the optional phase-in percentage determination in Section 2.3.1(a) above, the cumulative total of model-year emission reductions as determined only for PCs and LDTs certified to this Section 2.3.2. must also be equal to or larger than the required cumulative total by end of the 2004 model year. A manufacturer shall be allowed to include vehicles introduced before the first model year of the scheduled phase-in (e.g., in the previous example, 10 percent introduced one year before the scheduled phase-in begins would be calculated as: ($10\% * 5 \text{ years}$) and added to the cumulative total).

2.3.2.1 For the purposes of the implementation schedule set forth in this subparagraph 2.3.2, each manufacturer's PC and LDT fleet shall be defined as the total projected number of low-emission and ultra-low-emission PCs and LDTs from 0-5750 pounds loaded vehicle weight sold in California. Each manufacturer's MDV fleet shall be defined as the total projected number of low-emission, ultra-low-emission, and super-ultra-low-emission MDVs less than 8501 pounds gross vehicle weight rating sold in California.

3. Calculation of NMOG Credits/Debits

3.1 Calculation of NMOG Credits for Passenger Cars and Light-Duty Trucks.

3.1.1 In 2001 and subsequent model years, a manufacturer that achieves fleet average NMOG values lower than the fleet average NMOG requirement for the corresponding model year shall receive credits in units of g/mi NMOG determined as:

$$\frac{[(\text{Fleet Average NMOG Requirement}) - (\text{Manufacturer's Fleet Average NMOG Value})]}{(\text{Total No. of Vehicles Produced and Delivered for Sale in California, Including ZEVs and HEVs})} \times$$

A manufacturer with 2001 and subsequent model year fleet average NMOG values greater than the fleet average requirement for the corresponding model year shall receive debits in units of g/mi NMOG equal to the amount of negative credits determined by the aforementioned equation. For the 2001 through 2003 model year, the total g/mi NMOG credits or debits earned for PCs and LDTs 0-3750 lbs. LVW and for LDTs 3751-5750 lbs. LVW shall be summed together. For the 2004 and subsequent model years, the total g/mi NMOG credits or debits earned for PCs and LDTs 0-3750 lbs. LVW and for LDTs 3751-7300 lbs. LVW shall be summed together. The resulting amount shall constitute the g/mi NMOG credits or debits accrued by the manufacturer for the model year.

3.1.2. For 2004 through 2006 model years, a manufacturer shall equalize emission debits within three model years and prior to the end of the 2007 model year by earning g/mi NMOG emission credits in an amount equal to the g/mi NMOG debits, or by submitting a commensurate amount of g/mi NMOG credits to the Executive Officer that were earned previously or acquired from another manufacturer. For 2007 and subsequent model years, manufacturers shall equalize emission debits by the end of the following model year.

3.2 Calculation of Vehicle Equivalent NMOG Credits for Medium-Duty Vehicles. In 2001 and subsequent model years, a manufacturer that produces and delivers for sale in California MDVs in excess of the equivalent requirements for LEVs, ULEVs and/or SULEVs certified to the exhaust emission standards set forth in section E.1 of these test procedures or to the exhaust emission standards set forth in Title 13, CCR, Section 1956.8(h) shall receive "Vehicle-Equivalent Credits" (or "VECs") calculated in accordance with the following equation, where the term "produced" means produced and delivered for sale in California:

$$\begin{aligned} & \{[(\text{No. of LEVs Produced excluding HEVs}) + \\ & \quad (\text{No. of LEV HEVs} \times \text{HEV VEC factor for LEVs})] + \\ & \quad (1.20 \times \text{No. of LEVs certified to the 150,000 mile standards})\} \\ & \quad (\text{No. of "Type C HEV" LEVs Produced})] + \\ \text{-----} & \quad [(\text{No. of "Type A HEV" LEVs Produced}) \times (1.2)] + \\ \text{-----} & \quad [(\text{No. of "Type B HEV" LEVs Produced}) \times (1.1)] - \\ & \quad (\text{Equivalent No. of LEVs Required to be Produced})\} + \end{aligned}$$

$$\{[(1.4) \times (\text{No. of ULEVs Produced excluding HEVs}) +$$

$$\frac{(\text{No. of ULEV HEVs} \times \text{HEV VEC factor for ULEVs}) + (1.50 \times \text{No. of ULEVs certified to the 150,000 mile standards})}{(\text{No. of "Type C HEV" ULEVs Produced})} +$$

$$\frac{[(1.7) \times (\text{No. of "Type A HEV" ULEVs Produced})] +}{[(1.5) \times (\text{No. of "Type B HEV" ULEVs Produced})] -$$

$$[(1.4) \times (\text{Equivalent No. of ULEVs Required to be Produced})] +$$

$$\{[(1.7) \times (\text{No. of SULEVs Produced excluding HEVs}) + \frac{(\text{No. of SULEV HEVs} \times \text{HEV VEC factor for SULEVs}) + (1.75 \times \text{No. of SULEVs certified to the 150,000 mile standards})}{(\text{No. of "Type C HEV" SULEVs Produced})} +$$

$$\frac{[(\text{No. of "Type A HEV" SULEVs Produced}) \times (1.7)] +}{[(\text{No. of "Type B HEV" SULEVs}) \times (1.5)] -$$

$$[(1.7) \times [(\text{Equivalent No. of SULEVs Required to be Produced})]] +$$

$$[(2.0) \times (\text{No. of ZEVs Certified and Produced as MDVs})].$$

3.2.1 The MDV HEV VEC factor is calculated as follows:

$$\frac{1 + [(\text{LEV standard} - \text{ULEV standard}) \times (\text{Zero-emission VMT Factor}) \div \text{LEV standard}] \text{ for LEVs;}}{1 + [(\text{ULEV standard} - \text{SULEV standard}) \times (\text{Zero-emission VMT Factor}) \div \text{ULEV standard}] \text{ for ULEVs;}}$$

$$\frac{1 + [(\text{SULEV standard} - \text{ZEV standard}) \times (\text{Zero-emission VMT Factor}) \div \text{SULEV standard}] \text{ for SULEVs;}}$$

where "Zero-emission VMT Factor" for an HEV is determined in accordance with Section D.2.2.1 of the "California Zero-Emission and Hybrid Electric Vehicle Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Year Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles."

3.2.2 A manufacturer that fails to produce and deliver for sale in California the equivalent quantity of MDVs certified to LEV, ULEV and/or SULEV exhaust emission standards, shall receive "Vehicle-Equivalent Debits" (or "VEDs") equal to the amount of negative VECs determined by the aforementioned equation.

3.2.3 Only ZEVs certified as MDVs and not used to meet the ZEV requirement shall be included in the calculation of VECs.

3.3 Procedure for Meeting ZEV Requirement and Earning ZEV Credits. The procedures for meeting the ZEV phase-in requirements and for earning ZEV credits are contained in the "California Zero-Emission and Hybrid Electric Vehicle Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles," incorporated by reference herein.

3.4 Procedure for Offsetting Debits.

3.4.1 For 2001 through 2003 and for 2007 and subsequent model years, manufacturers shall equalize emission debits by the end of the following model year. If emission debits are not equalized within the specified time period, the manufacturer shall be subject to the Health and Safety Code section 43211 civil penalty applicable to a manufacturer which sells a new motor vehicle that does not meet the applicable emission standards adopted by the state board. The cause of action shall be deemed to accrue when the emission debits are not equalized by the end of the specified time period. For the purposes of Health and Safety Code section 43211, the number of passenger cars and light-duty trucks not meeting the state board's emission standards shall be determined by dividing the total amount of g/mi NMOG emission debits for the model year by the g/mi NMOG fleet average requirement for PCs and LDTs 0-7300 lbs. LVW applicable for the model year in which the debits were first incurred and the number of medium-duty vehicles not meeting the state board's emission standards shall be equal to the amount of VEDs incurred.

3.4.2 The emission credits earned in any given model year shall retain full value through the subsequent model year. The value of any credits not used to equalize the previous model-year's debit shall be discounted by 50% at the beginning of second model year after being earned, shall be discounted to 25% of its original value if not used by the beginning of the third model year after being earned, and will have no value if not used by the beginning of the fourth model year after being earned.

4. Intermediate In-Use Compliance Standards .

4.1 The following intermediate in-use compliance standards for 50,000 miles and 120,000 miles for MDVs from 3751-14,000 lbs. ALVW, including fuel-flexible, bi-fuel and dual-fuel vehicles when operating on an available fuel other than gasoline, shall apply for the specified model years only. In-use compliance with standards beyond 50,000 miles shall be waived through the 2001 model year for SULEVs.

Intermediate In-Use Compliance Standards *										
(in grams per mile)										
Emission Category	Model Year	Durability Vehicle Basis (mi)	3751-5750 lbs.		5751 - 8500 lbs.		8501-10,000 lbs.		10,001-14,000 lbs.	
			NMO G	NOx	NMO G	NOx	NMO G	NOx	NMOG	NOx
ULEV	2001-2002	50,000	0.128	--	0.156	--	0.184	--	0.240	--
	2001-2002	120,000	0.160	--	0.195	--	0.230	--	0.300	--
SULEV	through 2002	50,000	0.072	0.3	0.084	0.45	0.100	0.5	0.130	0.7
	2002	120,000	0.100	0.4	0.117	0.6	0.138	0.65	0.180	1.0

* Dashes mean that the standards in Section E.1.1. apply.

4.2 **Intermediate In-Use Compliance Standards for Fuel-Flexible, Bi-Fuel and Dual-Fuel Medium-Duty SULEVs Operating on Gasoline.** For fuel-flexible, bi-fuel and dual-fuel 2001 model year MDV SULEVs operating on gasoline, the following intermediate in-use compliance standards for NMOG emissions at 50,000 miles, apply:

Fuel-Flexible, Bi-Fuel and Dual-Fuel MDVs Intermediate In-Use Compliance Standards		
Test Weight (lbs.)	Vehicle Emission Category	50,000 (g/mi)
3751-5750	SULEV	0.128
5751-8500	SULEV	0.156
8501-10,000	SULEV	0.184
10,001-14,000	SULEV	0.240

Compliance with the standards beyond 50,000 miles shall be waived for the 2001 model year for SULEVs.

5. Reactivity Adjustment Factors

A reactivity adjustment factor is the ratio of the specific reactivity of a low-emission vehicle designed to operate on a fuel other than conventional gasoline (including a fuel-flexible, bi-fuel or dual-fuel vehicle when operating on any fuel other than conventional gasoline) compared to the NMOG baseline specific reactivity of vehicles in the same vehicle emission category operating on conventional gasoline. The procedure for determining compliance with the standard is set forth in Section H.1.2 of these test procedures.

5.1 The following specific reactivity values and generic reactivity adjustment factors have been established pursuant to the criteria established in Part II.D of these test procedures. A manufacturer requesting to certify to existing standards utilizing an adjustment factor unique to its vehicle/fuel system must follow the data requirements described in Part II, Section D of these test procedures.

5.1.1 The following reactivity adjustment factors apply through the 2003 model year:

	Light-Duty Vehicles 0-5750 lbs. LVW			Medium-Duty Vehicles 3750-8,500 lbs. ALVW	
	TLEV	LEV	ULEV	LEV	ULEV
Fuel*	Baseline Specific Reactivity (grams ozone / gram NMOG)				
Conventional Gasoline	3.42	3.13	3.13	3.13	3.13
	Reactivity Adjustment Factors				
Phase 2 RFG	0.98	0.94	0.94	0.94	0.94
M85	0.41	0.41	0.41	0.41	0.41
Natural Gas	1.0	0.43	0.43	0.43	0.43
LPG	1.0	0.50	0.50	0.50	0.50
	Methane Reactivity Adjustment Factors				
Natural Gas	0.0043	0.0047	0.0047	0.0047	0.0047

*The fuel specifications are set forth in Part II.A., Section 100.3 (reformulated gasoline, M85, CNG and LPG) and Part II.D (conventional gasoline specification) of these test procedures.

5.2 **Methanol and LPG Requirements.** For a candidate vehicle/fuel system powered by methanol or liquefied petroleum gas, the reactivity adjustment factor determined by the manufacturer shall be multiplied by 1.1. The resulting value shall constitute the "reactivity adjustment factor" for the methanol or liquefied petroleum gas-powered vehicle/fuel system.

F. Requirements and Procedures for Durability Demonstration

1. §86.1816 Durability group determination.

1.1 §86.1816-01 [No change.]

1.2 Separate durability groups shall be created for HEVs and also for vehicles certifying to the optional 150,000 mile standards in Section I.E.1.1.2.

2. §86.1817 Evaporative/refueling emission family determination. [The provisions of this section are set forth in the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Motorcycles,” and “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”]

3. §86.1818 Durability data vehicle selection. [No change.]

4. §86.1819 Durability demonstration procedures for exhaust emissions

4.1 §86.1819-01 [No change.]

4.2 **SFTP.** These procedures are not applicable to vehicles certified to the SFTP standards set forth in Section E.1.2.2.

5. §86.1820 Durability demonstration procedures for evaporative emissions. [The provisions of this section are set forth in the “California Evaporative Emission Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks, Medium-Duty Vehicles, Heavy-Duty Vehicles and Motorcycles.”]

6. §86.1821 Durability demonstration procedures for refueling emissions. [The provisions of this section are set forth in the “California Refueling Emission Standards and Test Procedures for 2001 and Subsequent Model Motor Vehicles.”]

7. §86.1822 Assigned Deterioration Factors for Small Volume Manufacturers and Small Volume Test Groups. [No change.]

7.1 §86.1822-01. [No change.]

G. Procedures for Demonstration of Compliance with Emission Standards

1. §86.1823 Test Group Determination. [No change.]

1.1 §86.1823-01. [No change.]

1.2 **HEVs.** Manufacturers of hybrid electric vehicles shall create separate test groups based on both the type of battery technology employed by the HEV and upon the features most related to their exhaust emission characteristics.

2. §86.1824 Emission data vehicle selection

2.1 §86.1824-01. [No change.]

2.2 50°F Requirements

2.2.1 Vehicle Selection. A manufacturer shall select at least three emission data and/or engineering development vehicles each year from PC or LDT test groups and at least three emission data and/or engineering development vehicles from MDV test groups.

2.2.2 The same engine family shall not be selected in the succeeding two years unless the manufacturer produces fewer than three test groups. If the manufacturer produces more than three TLEV, LEV, ULEV or SULEV test groups per model year, the Executive Officer may request 50EF testing of specific test groups. If the manufacturer provides a list of the TLEV, LEV, ULEV and SULEV test groups that it will certify for a model year and provides a description of the technologies used on each test group (including the information in Section G.2.1.2(1)), the Executive Officer shall select the test groups subject to 50EF testing within a 30 day period after receiving such a list and description. The Executive Officer may revise the test groups selected after the 30 day period if the information provided by the manufacturer does not accurately reflect the test groups actually certified by the manufacturer.

3. §86.1825 Durability data and emission data testing requirements

3.1 §86.1825-01. Amend as follows:

3.1.1 Amend (b)(1) as follows: SFTP testing shall not be required on vehicles certified to the SFTP standards set forth in Section E.1.2.2.

3.1.2 Amend (b)(4)(i) as follows: All 2001 and subsequent model-year emission-data vehicles shall be required to be tail-pipe tested at 4,000 miles and demonstrate compliance with the California Inspection and Maintenance ("I/M") emission standards in place at the time of certification as specified in the "Mandatory Exhaust Emissions Inspection Standards and Test Procedures," Title 16, California Code of Regulations, Section 3340.42. Test vehicles shall undergo preconditioning procedures prior to the tail-pipe test which consist of idle conditions for a minimum period of ten minutes after the thermostat is open. Preconditioning and test procedures shall be conducted at an ambient temperature from 68° to 86° F. The manufacturer shall, in accordance with good engineering practice, attest that such test vehicles will meet the requirements of this section when preconditioned and tested at ambient temperatures from 35° to 68° F.

3.1.3 Amend (b)(4)(ii) as follows: In lieu of testing vehicles according to the provisions of §86.1825(b)(4)(i), a manufacturer may provide a statement in its application for certification that, based on the manufacturer's engineering evaluation

of such I/M testing as the manufacturer deems appropriate, all light-duty vehicles and light-duty trucks comply with the I/M emission standards.

3.1.4 Delete (b)(5). Idle CO Testing.

3.2 **50°F Requirements.** A manufacturer shall demonstrate compliance with this requirement each year by testing at least three PC or LDT and three MDV emission data and/or engineering development vehicles (with at least 4000 miles) as determined under the provisions of Section G.2.2 of these test procedures. Only TLEVs, LEVs, ULEVs and SULEVs are to be considered for testing at 50EF. It is not necessary to apply deterioration factors (DFs) to the 50EF test results to comply with this requirement.

3.3 **Highway Fuel Economy Test.** The exhaust emissions shall be measured from all exhaust emission data vehicles tested in accordance with the federal Highway Fuel Economy Test (HWFET; 40 CFR Part 600, Subpart B). The oxides of nitrogen emissions measured during such tests shall be multiplied by the oxides of nitrogen deterioration factor computed in accordance with 40 CFR §86.1819, and then rounded and compared with the standard as set forth in Section I.E1.1 preceding. All data obtained pursuant to this paragraph shall be reported in accordance with procedures applicable to other exhaust emissions data required pursuant to these procedures. In the event that one or more of the manufacturer's emission data vehicles fail the HWFET standard listed in Section E of these test procedures, the manufacturer may submit to the Executive Officer engineering data or other evidence showing that the system is capable of complying with the standard. If the Executive Officer finds, on the basis of an engineering evaluation, that the system can comply with the HWFET standard, he or she may accept the information supplied by the manufacturer in lieu of vehicle test data.

4. **§86.1826 Acceptance of Vehicles for Testing** [No change.]

5. **§86.1827 Mileage accumulation requirements for test vehicles.** [No change.]

6. **§86.1828 Optional equipment and air conditioning.** [No change.]

7. **§86.1829 Adjustable parameters.** [No change.]

8. **§86.1830 Allowable maintenance.**

8.1 §86.1830-01. [No change.]

8.2 HEVs. (a) The manufacturer shall equip the vehicle with a maintenance indicator consisting of a light that shall activate automatically by illuminating the first time the minimum performance level is observed for all battery system components. Possible battery system components requiring monitoring are: (i) battery water level; (ii) temperature control; (iii) pressure control; and (iv) other parameters critical for determining battery condition.

(b) The manufacturer shall equip the vehicle with a useful life indicator for the battery system consisting of a light that shall illuminate the first time the battery system is unable to achieve an all-electric operating range (starting from a full state-of-charge) which is at least 75% of the range determined for the vehicle in the Urban Driving Schedule portion of the All-Electric Range Test (see the California Zero-Emission and Hybrid Electric Vehicle Exhaust Emission Standards and Test Procedures for 2001 and Subsequent Model Year Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles).

9. **§86.1831 Confirmatory certification testing.** [No change.]

10. **§86.1832 Manufacturer-supplied production vehicles for testing.** [No change.]

11. §86.1833 Rounding of emission measurements

11.1 §86.1833-01 [No change.]

11.2 Fleet average NMOG value calculations shall be rounded, in accordance with ASTM E29-67, to four significant figures before comparing with fleet average NMOG requirements.

12. §86.1834 Small volume manufacturers certification procedures

12.1 §86.1834-01 [No change, except that the reference to 15,000 units shall mean 4,500 units in California.]

12.2 HEVs. The optional small volume manufacturer certification procedures shall not apply to hybrid electric vehicles which must meet the requirements applicable to large volume manufacturers and large volume test groups. However, hybrid electric vehicle manufacturers shall be subject to the in-use verification requirements established in §86.1834.

13. §86.1835 Carryover of certification data. [No change.]

14. §86.1836 Special test procedures

14.1 §86.1836-01 [No change.]

14.2 Vehicles Equipped with Periodically Regenerating Trap Oxidizer Systems.

For vehicles equipped with periodically regenerating trap oxidizer systems, the manufacturer shall propose a procedure for certifying those vehicles for advance approval by the Executive Officer.

H. Certification, Information and Reporting Requirements

1. §86.1837 Compliance with certification emission standards

1.1 §86.1837-01. [No change.]

1.2 Reactivity Adjustment Factors.

1.2.1 The NMOG emission results from all TLEVs, LEVs, ULEVs and SULEVs certifying on a fuel other than conventional gasoline, shall be numerically adjusted to establish an NMOG exhaust mass emission value equivalent. A manufacturer shall multiply the NMOG exhaust emission result for each emission-data vehicle by the appropriate reactivity adjustment factor listed in Section E.5. of these test procedures or established by a manufacturer pursuant to Part II, Section D of these test procedures. This product shall be multiplied by, or added to in the case of additive DFs, the applicable deterioration factor to determine compliance with the standard.

1.2.2 Vehicles operating on natural gas shall add to the result of subparagraph 1.2.1, the product of the methane mass emission value and the methane reactivity adjustment factor. This result shall be compared to the NMOG exhaust emission standards to determine compliance with the standards.

1.3 **Scope of Certification.** Certification, if granted, is effective only for the vehicle/test group described in the original manufacturer's certification application. Modifications by a secondary manufacturer to vehicles/engines shall be deemed not to increase emissions above the standards under which those vehicles/engines were certified and to be within the original certification if such modifications do not: (1) increase vehicle weight more than 10 percent above the curb weight, increase frontal area more than 10 percent, or result in a combination increase of weight plus frontal area of more than 14 percent; or (2) include changes in axle ratio, tire size, or tire type resulting in changes in the drive train ratio of more than 5 percent; or (3) include any modification to the emission control system. No originally certified vehicle/engine which is modified by a secondary manufacturer in a manner described in items (1) through (3) of the preceding sentence may be sold to an ultimate purchaser, offered or delivered for sale to an ultimate purchaser, or registered in California unless the modified vehicle/engine is certified by the state board in accordance with applicable test procedures to meet emission standards for the model year for which the vehicle/engine was originally certified. For the purposes of this subsection, "secondary manufacturer" means any person, other than the original manufacturer, who modifies a new motor vehicle prior to sale to the ultimate purchaser.

1.4 For vehicles certified to the SFTP standards in Section E1.2.2, full and intermediate useful life shall mean 4,000 miles.

2. §86.1838 Addition of a vehicle after certification/ and changes to a vehicle covered by certification. [No change.]

3. §86.1839 General information requirements

3.1 §86.1839-01 [No change.]

3.2 **Alternative Fuel Information.** For 2001 and subsequent model-year TLEVs, LEVs, ULEVs, and SULEVs not certified exclusively on gasoline or diesel, the manufacturer shall submit projected California sales and fuel economy data nineteen months prior to January 1 of the model year for which the vehicles are certified.

3.3 **Credit Reporting.** In order to verify the status of a manufacturer's compliance with the fleet average or phase-in requirements for a given model year, and in order to confirm the accrual of credits or debits, each manufacturer shall submit an annual report to the Executive Officer which sets forth the production data used to establish compliance by no later than March 1 of the calendar year following the close of the model year.

3.4 **SFTP.** A manufacturer that introduces MDVs prior to 2003 model year SFTP requirements set forth in E1.2.2, must submit the implementation information required for vehicles produced in subsequent model years.

4. §86.1840 Information Requirements: Application for Certification and Submittal of Information Upon Request

4.1 §86.1840-01. Amend as follows:

4.1.1 Delete §86.1840-01(d)(9).

4.2 **OBD Requirements.** For 2001 and subsequent model-year passenger cars, light-duty trucks and medium-duty vehicles, information shall be submitted in the application for certification according to the requirements of Title 13, CCR, Section 1968.1.

4.3 **HEVs.** HEVs shall include in their Part I application for certification the requirements set forth in the "California Zero-Emission and Hybrid Electric Vehicle Standards and Test Procedures for 2001 and Subsequent Model Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles."

I. In-Use Compliance Requirements and Procedures

1. §86.1841 Manufacturer in-use verification testing requirements

1.1 §86.1841-01. Amend as follows:

1.1.1 Table S01-5 California Small Volume Manufacturers and HEV Manufacturers

California test group annual sales	1-1,500	1,501-4,500
High Mileage	voluntary	2

1.1.2 Table S01-6 - California Large Volume Manufacturers

California test group annual sales	4,500-15,000	15,001-25,000	>25,000
High Mileage	4	5	6

1.1.3. **High Mileage Testing.** Amend subparagraph (c)(2) of 40 CFR §86.1841-01 to read: All test vehicles must have a minimum odometer mileage of 50,000 miles. At least one vehicle of each test group certified to the emission standards in Section E.1.1.1 must have a minimum age and odometer mileage of 75,000 for light-duty vehicles and 90,000 miles for medium-duty vehicles. At least one vehicle of each test group certified to the emission standards in Section E.1.1.2 must have a minimum age and odometer mileage of 90,000 miles. See §86.1834-01(c)(2) for small volume manufacturer mileage requirements.

1.1.4 **Vehicle Procurement.** Amend subparagraph (d)(3)(i) of 40 CFR §86.1841-01 to add: Test groups certified to California standards must be procured in California.

1.2 §86.1841-04. Amend as follows:

1.2.1 Table S04-5 California Small Volume Manufacturers and HEV Manufacturers

California test group annual sales	1-1,500	1,501-4,500
Low Mileage	voluntary	0
High Mileage	voluntary	2

1.2.2 Table S04-6 - California Large Volume Manufacturers

California test group annual sales	4,500-15,000	15,001-25,000	>25,000
Low Mileage	2	3	4
High Mileage	4	5	6

1.2.3 **High Mileage Testing.** Amend subparagraph (c)(2) of 40 CFR §86.1841-04 to read as follows: All test vehicles must have a minimum odometer mileage of 50,000 miles. At least one vehicle of each test group certified to the emission standards in Part I, Section E.1.1.1 of these procedures must have a minimum age and odometer mileage of 75,000 for light-duty vehicles and 90,000 miles for medium-duty vehicles. At least one vehicle of each test group certified to the emission standards in Part I, Section E.1.1.2 of these test procedures must have a minimum age and odometer mileage of 90,000 miles. See §86.1834-01(c)(2) for small volume manufacturer mileage requirements.

1.2.4 **Vehicle Procurement.** Amend subparagraph (d)(3)(i) of 40 CFR §86.1841-04 to add: Test groups certified to California standards must be procured in California.

1.3 **SFTP.** The manufacturer in-use verification testing requirements shall not apply to vehicles certified to the SFTP standards set forth in Section E.1.2.2 of these test procedures.

2. §86.1842 Manufacturer in-use confirmatory testing requirements. [No change.]

2.1 §86.1842-01 [No Change.]

2.2 **SFTP.** The manufacturer in-use compliance testing requirements shall not apply to vehicles certified to the SFTP standards set forth in Section E.1.2.2 of these test procedures.

3. §86.1843 Manufacturer in-use verification and in-use confirmatory testing; submittal of information and maintenance of records. [No change.]

Appendices I, II, and III to §86.1841-01 [No change.]

J. Procedural Requirements

1. §86.1844 Certification. [No change.]
2. §86.1845 Right of entry. [No change.]
3. §86.1846 Denial, Suspension or Revocation of Certificate of Conformity. [No change.]
4. §86.1847 Application of good engineering judgment to manufacturers' decisions. [No change.]
5. §86.1848 Waivers for good in-use emission performance. [No change.]
6. §86.1849 Certification hearings. [No change.]